Versatile Information System - Integrated, ONline (VISION)

PM ITTS Industry Day Conference

12 June 2003

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PROGRAM TEAM

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What is VISION?

- **VISION is a comprehensive, holistic, top down redesign of the manner in which information is collected and managed, and ultimately transformed into knowledge**

- **VISION employs a web-centric approach that merges and exploits instrumentation and information management technologies.**

Background

- Started in 1998 as an Aberdeen Test Center Research and Development - Instrumentation project

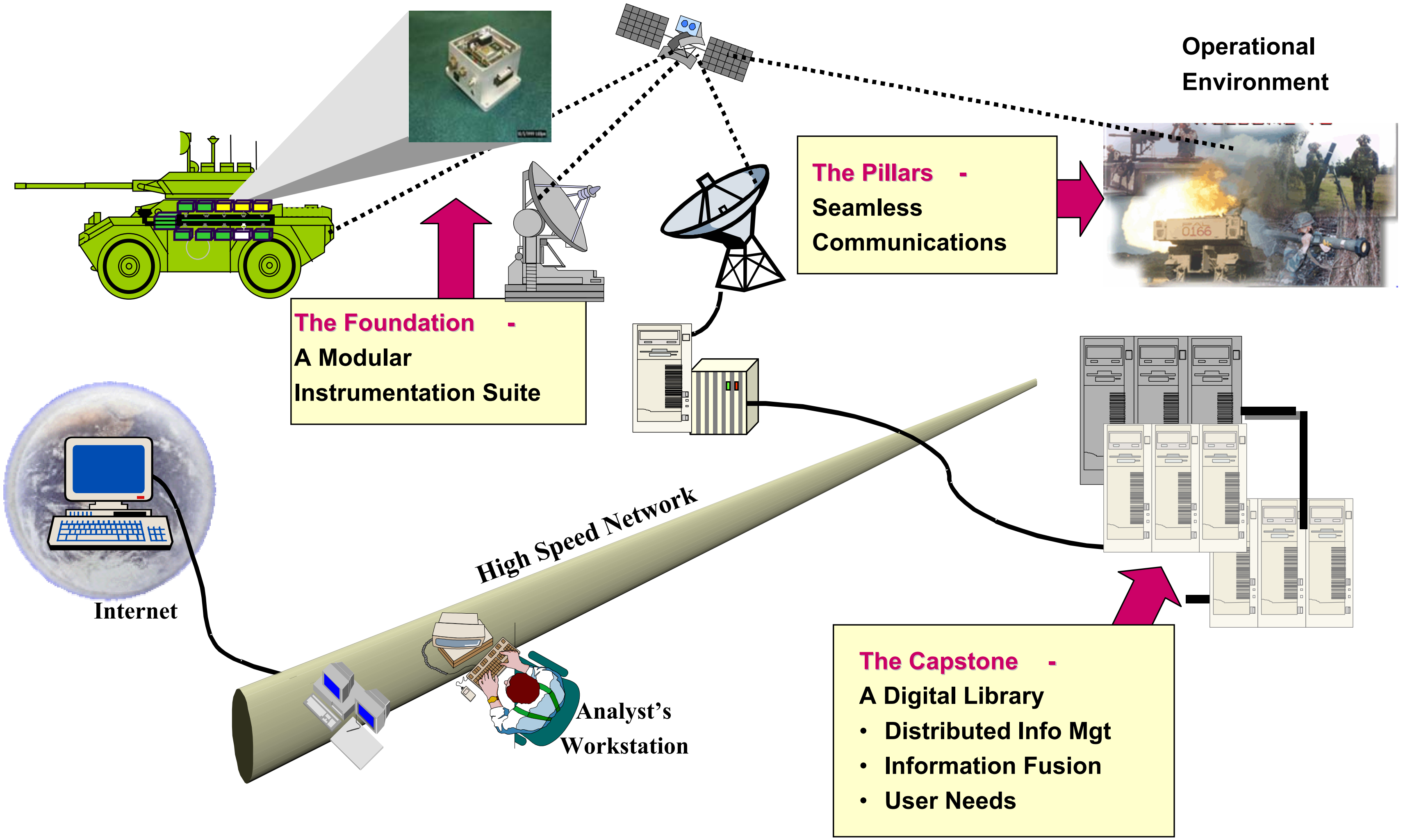
- Current features/capabilities
  - Small ruggedized Advanced Distributed Modular Acquisition System (ADMAS) devices
  - Wire neutral TCP/IP communications
  - VISION Digital Library

TERMINAL
I/O 1
I/O 2
ADMAS ANALOG DEVICE
ATC APG, MD.

VISION aids modeling and simulation efforts by:

- Decreasing the time required for test and experimentation
- Provide high fidelity reusable data
- Life cycle cataloging and management of information

Components of VISION

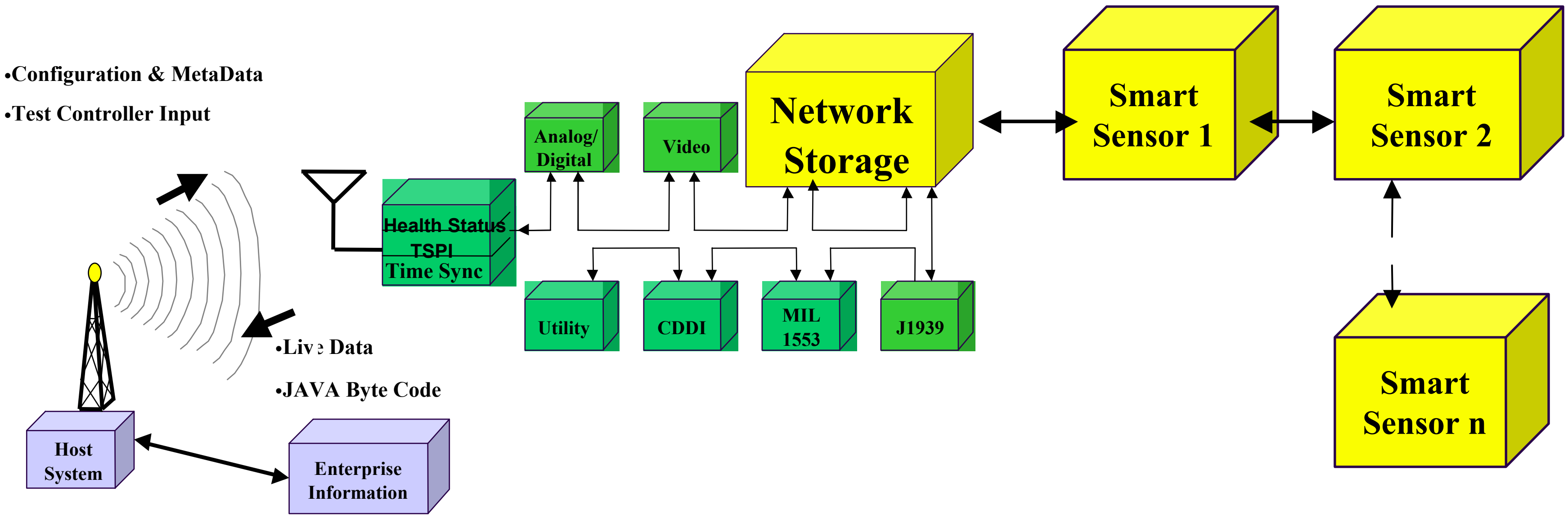

Operational Environment
Internet
High Speed Network
Analyst's Workstation

The Pillars -
Seamless Communications

The Foundation -
A Modular Instrumentation Suite

The Capstone -
A Digital Library
- Distributed Info Mgt
- Information Fusion
- User Needs

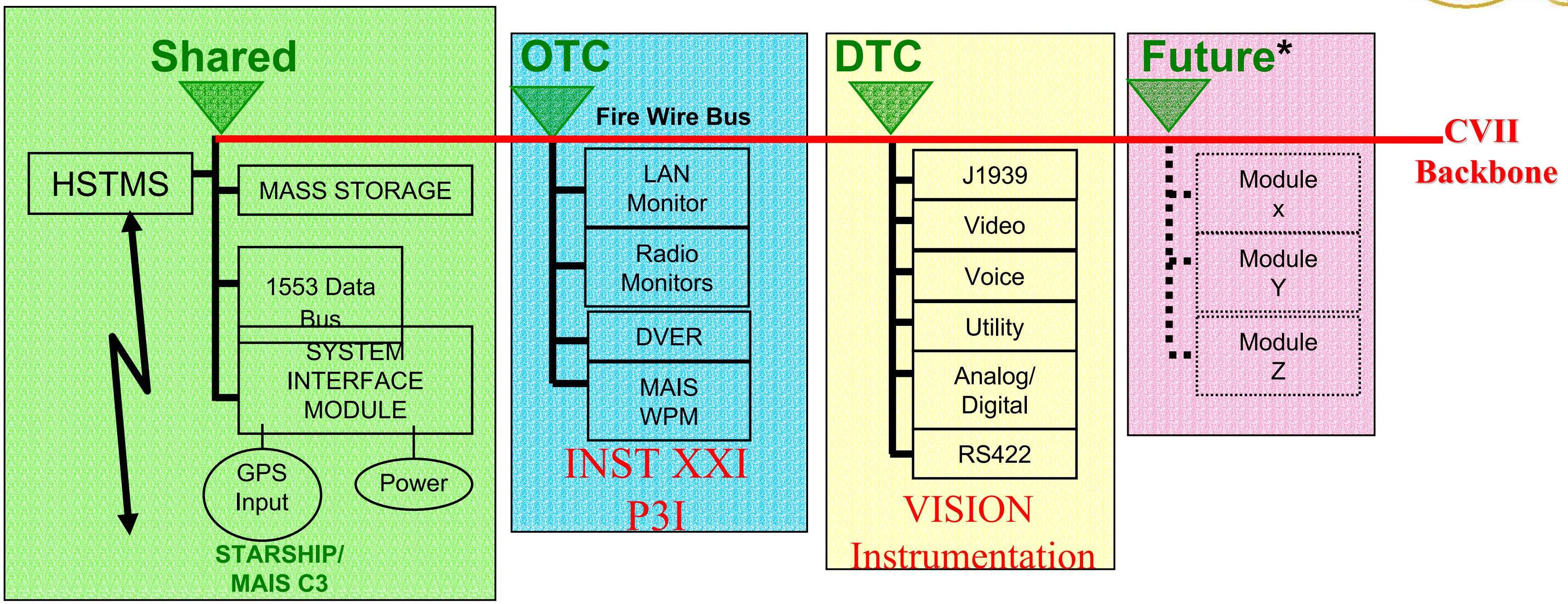
Smart Sensors Enhancement


•Configuration & MetaData
•Test Controller Input
•Live Data
•JAVA Byte Code
Host System
Enterprise Information
Health Status
TSPI
Time Sync
Analog/ Digital
Video
Network Storage
Utility
CDDI
MIL 1553
J1939
Smart Sensor 1
Smart Sensor 2
Smart Sensor n

🟩 **Existing network devices converted to IEEE 1394**

🟨 **Smart sensor developments**

CVII in a Snapshot



Shared

HSTMS

MASS STORAGE

1553 Data Bus

SYSTEM INTERFACE MODULE

GPS Input

Power

STARSHIP/ MAIS C3

OTC

Fire Wire Bus

LAN Monitor

Radio Monitors

DVER

MAIS WPM

INST XXI P3I

DTC

J1939

Video

Voice

Utility

Analog/ Digital

RS422

VISION Instrumentation

Future*

Module x

Module Y

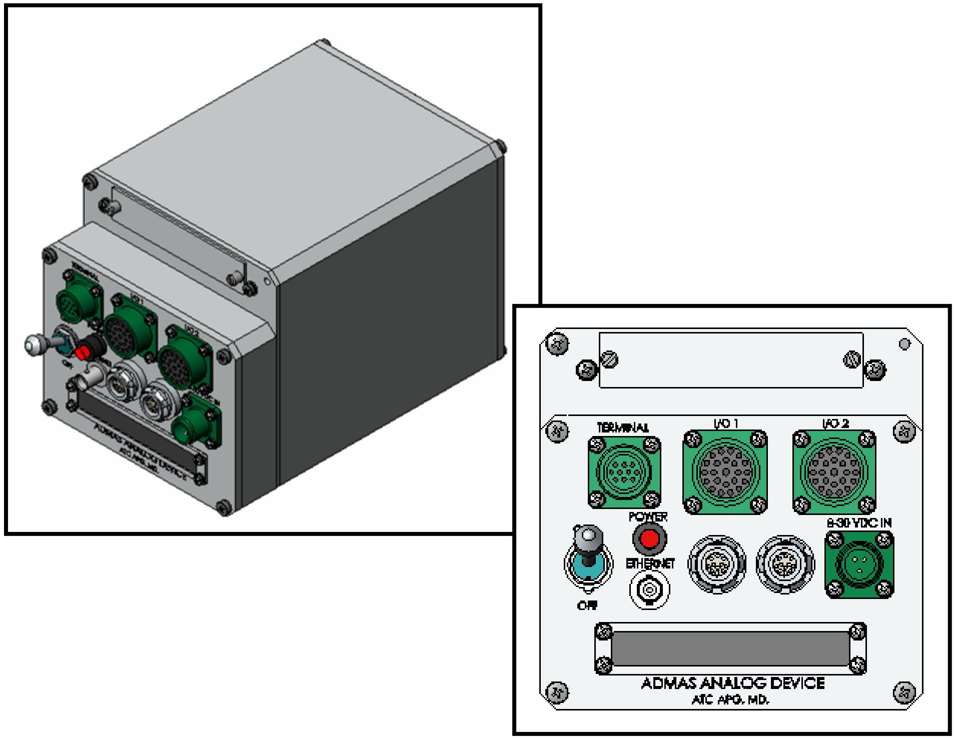
Module Z

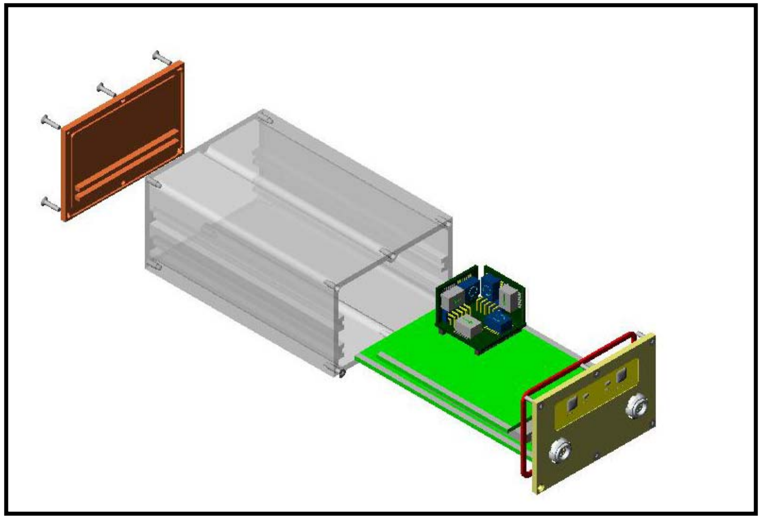
CVII Backbone

- •Effort to develop a common test instrumentation architecture.
- •Objective is to develop common message formats, protocols and connectivity requirements
- •Data typically collected includes weapons and system performance, reliability and maintainability, and crew performance.
- •Although the data analysis and evaluation efforts are very different, the data collection effort for DT and OT are very similar. By using CVII instrumentation, one suite of equipment could be used for either testing or training.

Motion Analysis Smart Sensor (MASS)

- The effort will involve developing two prototypes for the VISION program as part of the Instrumentation Suite
  - Design and develop a retrofit for the ADMAS module that will make it CVII compliant. The front panel of the ADMAS module will be modified to accommodate the new Firewire interface
  - Design and develop CVII network based Motion Analysis Smart Sensors (Axis Rate and Acceleration)


TERMINAL
I/O 1
I/O 2
POWER
ETHERNET
8-30 VDC IN
OFF
ADMAS ANALOG DEVICE
ATC APG, MD.



Business Opportunities

Acquisition Strategy

Individual awards for each VISION component development effort

FY04 Specific Areas of Interest

ADMAS

- Miniaturization of ADMAS box
  - Would like to make existing general purpose analog box 1/3 original size
  - MIL STD 1553B (C2)

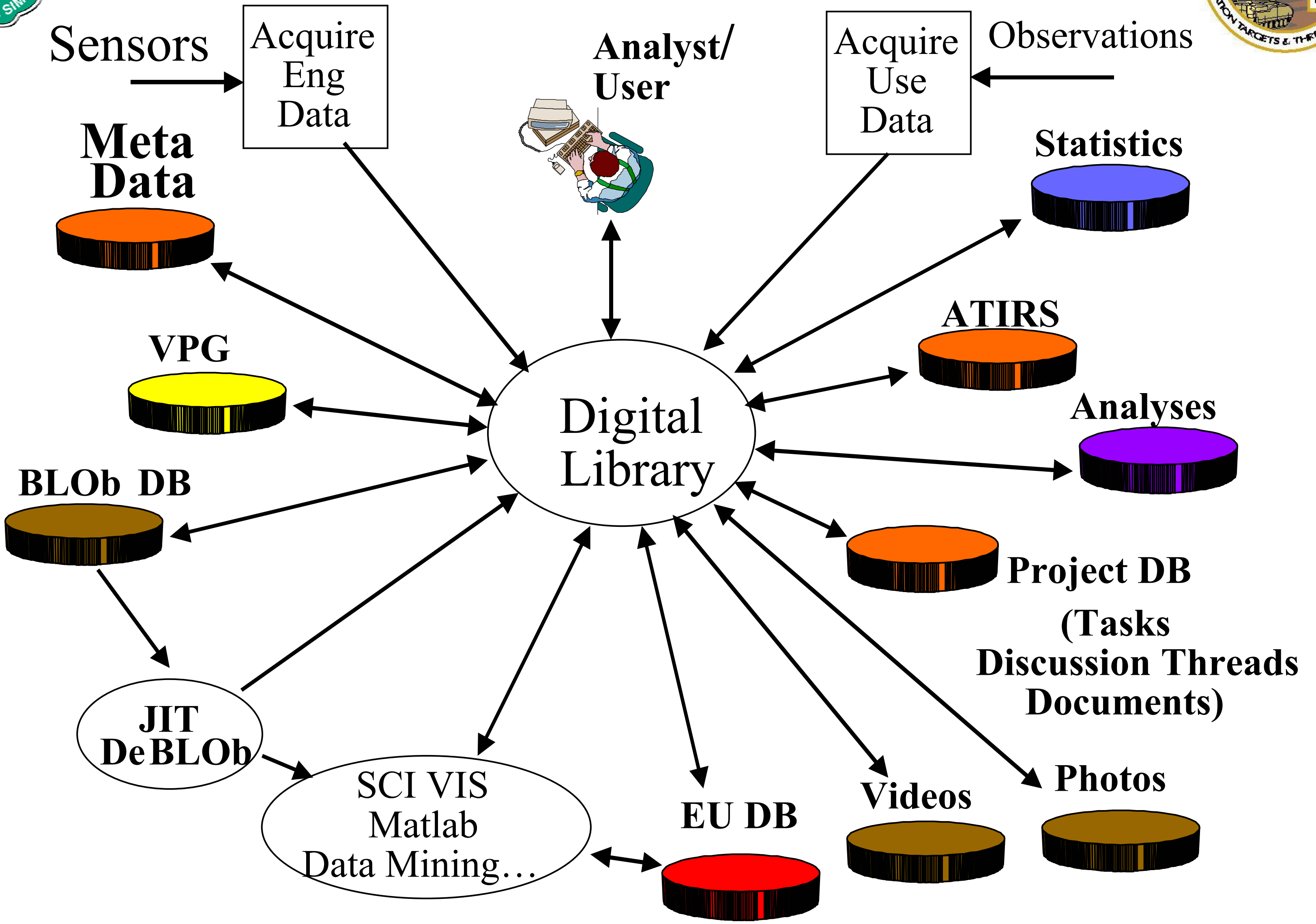
- Smart Sensor Development
  - 2 mega Sample/sec ballistic shock sensor
  - 0.5 mega sample/sec interior pressure sensor
  - Wireless smart sensor

- All new Smart Sensors need to be CVII compliant
  - ACM Systems is developing the CVII IDD
  - CVII website is under development & should be operational by end of July 03
  - POC: Jim Scala/916-669-4320

What is a Digital Library

- An *integrated* system of computer tools, services, data, applications and human processes, built to approved architectures, that enable the use of "*digital*" information to create *knowledge*

VISION DATA FLOW

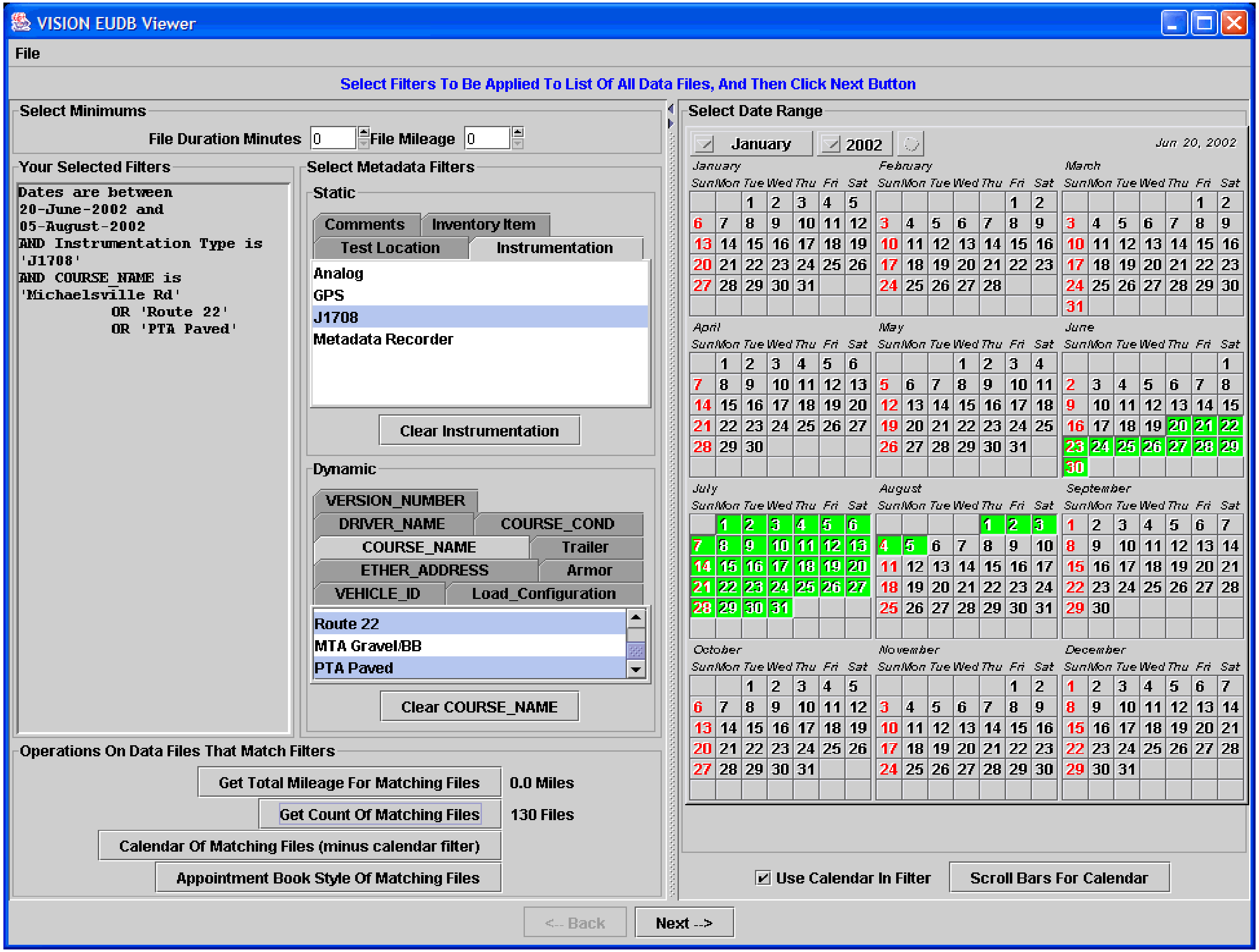

Sensors
Acquire Eng Data
Analyst/ User
Acquire Use Data
Observations
Meta Data
Statistics
ATIRS
VPG
Analyses
BLOb DB
Digital Library
Project DB
(Tasks
Discussion Threads
Documents)
JIT DeBLOb
SCI VIS
Matlab
Data Mining…
EU DB
Videos
Photos

I
M
O

VISION Digital Library Current Uses

- Centralized Document Storage
  - Test Documents: Test Plan, Test Reports
  - Planning Documents: TOPs, SOPs
- Test Data:
  - Daily Summaries
  - TIRs
  - Photographs
  - Raw, Reduced and Summarized Data
  - Secure and Restricted Access to Projects
- Project Community Communication
  - Announcements, Messages, Discussion Groups, Test Status
  - Document and Project Change Notification through email
- Software Distribution
  - Info Access, Internet Explorer, Patches

VISION Digital Library



VISION EUDB Viewer

File

Select Filters To Be Applied To List Of All Data Files, And Then Click Next Button

Select Minimums

File Duration Minutes: 0

File Mileage: 0

Your Selected Filters

```
Dates are between
20-June-2002 and
05-August-2002
AND Instrumentation Type is
'J1708'
AND COURSE_NAME is
'Michaelsville Rd'
          OR 'Route 22'
          OR 'PTA Paved'
```

Select Metadata Filters

Static

Comments | Inventory Item | Test Location | Instrumentation

- Analog
- GPS
- J1708
- Metadata Recorder

Clear Instrumentation

Dynamic

VERSION_NUMBER | DRIVER_NAME | COURSE_COND | COURSE_NAME | Trailer | ETHER_ADDRESS | Armor | VEHICLE_ID | Load_Configuration

- Route 22
- MTA Gravel/BB
- PTA Paved

Clear COURSE_NAME

Operations On Data Files That Match Filters

Get Total Mileage For Matching Files: 0.0 Miles

Get Count Of Matching Files: 130 Files

Calendar Of Matching Files (minus calendar filter)

Appointment Book Style Of Matching Files

Select Date Range

January 2002 — Jun 20, 2002

January

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June

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						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December

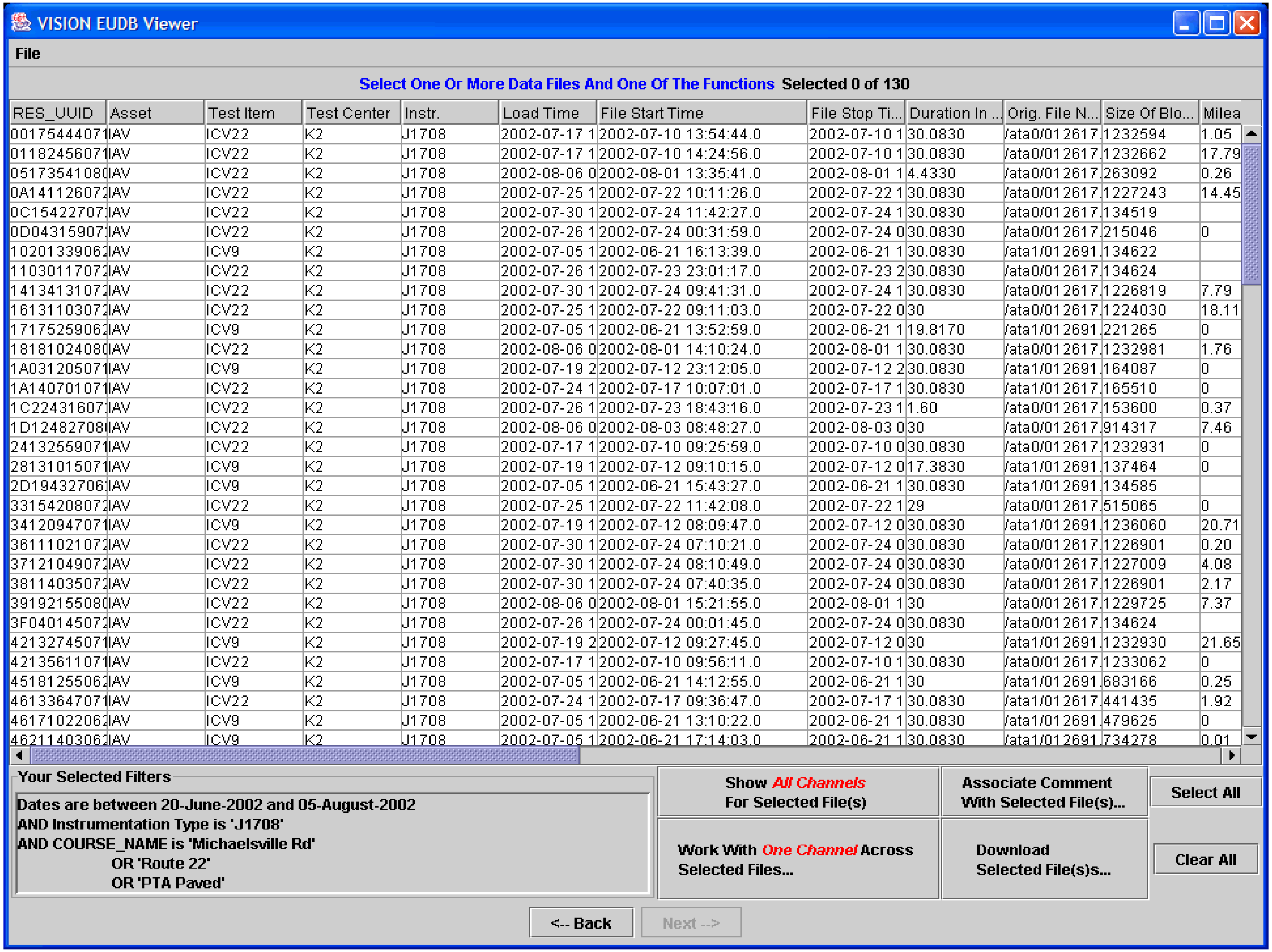
Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

☑ Use Calendar In Filter

Scroll Bars For Calendar

<-- Back | Next -->

VISION Digital Library



Select One Or More Data Files And One Of The Functions Selected 0 of 130

RES_UUID	Asset	Test Item	Test Center	Instr.	Load Time	File Start Time	File Stop Ti...	Duration In ...	Orig. File N...	Size Of Blo...	Milea
00175444071	IAV	ICV22	K2	J1708	2002-07-17 1	2002-07-10 13:54:44.0	2002-07-10 1	30.0830	/ata0/012617.	1232594	1.05
01182456071	IAV	ICV22	K2	J1708	2002-07-17 1	2002-07-10 14:24:56.0	2002-07-10 1	30.0830	/ata0/012617.	1232662	17.79
05173541080	IAV	ICV22	K2	J1708	2002-08-06 0	2002-08-01 13:35:41.0	2002-08-01 1	4.4330	/ata0/012617.	263092	0.26
0A141126072	IAV	ICV22	K2	J1708	2002-07-25 1	2002-07-22 10:11:26.0	2002-07-22 1	30.0830	/ata0/012617.	1227243	14.45
0C15422707	IAV	ICV22	K2	J1708	2002-07-30 1	2002-07-24 11:42:27.0	2002-07-24 1	30.0830	/ata0/012617.	134519	
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10201339062	IAV	ICV9	K2	J1708	2002-07-05 1	2002-06-21 16:13:39.0	2002-06-21 1	30.0830	/ata1/012691.	134622	
11030117072	IAV	ICV22	K2	J1708	2002-07-26 1	2002-07-23 23:01:17.0	2002-07-23 2	30.0830	/ata0/012617.	134624	
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18181024080	IAV	ICV22	K2	J1708	2002-08-06 0	2002-08-01 14:10:24.0	2002-08-01 1	30.0830	/ata0/012617.	1232981	1.76
1A031205071	IAV	ICV9	K2	J1708	2002-07-19 2	2002-07-12 23:12:05.0	2002-07-12 2	30.0830	/ata1/012691.	164087	0
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24132559071	IAV	ICV22	K2	J1708	2002-07-17 1	2002-07-10 09:25:59.0	2002-07-10 0	30.0830	/ata0/012617.	1232931	0
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38114035072	IAV	ICV22	K2	J1708	2002-07-30 1	2002-07-24 07:40:35.0	2002-07-24 0	30.0830	/ata0/012617.	1226901	2.17
39192155080	IAV	ICV22	K2	J1708	2002-08-06 0	2002-08-01 15:21:55.0	2002-08-01 1	30	/ata0/012617.	1229725	7.37
3F040145072	IAV	ICV22	K2	J1708	2002-07-26 1	2002-07-24 00:01:45.0	2002-07-24 0	30.0830	/ata0/012617.	134624	
42132745071	IAV	ICV9	K2	J1708	2002-07-19 2	2002-07-12 09:27:45.0	2002-07-12 0	30	/ata1/012691.	1232930	21.65
42135611071	IAV	ICV22	K2	J1708	2002-07-17 1	2002-07-10 09:56:11.0	2002-07-10 1	30.0830	/ata0/012617.	1233062	0
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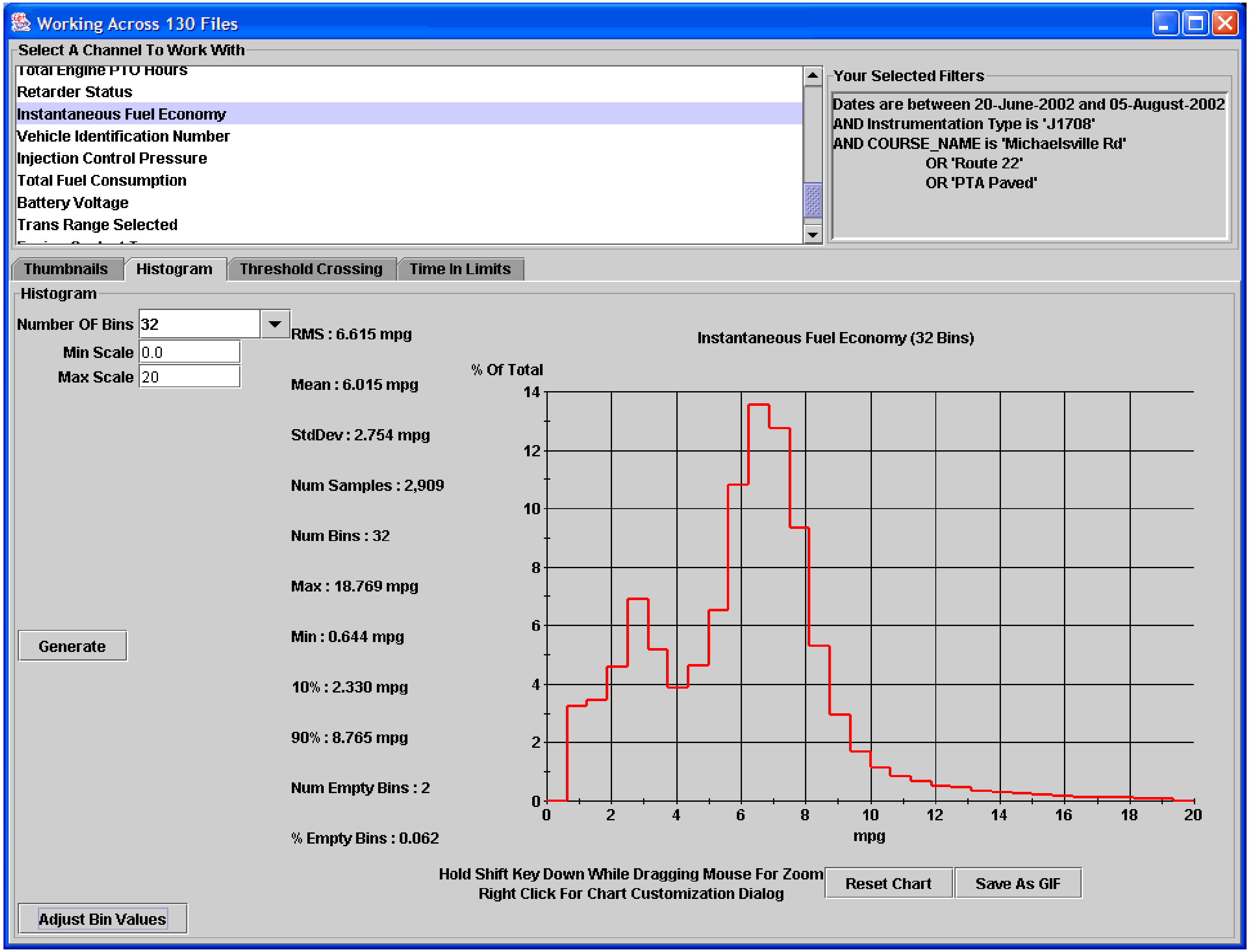
46171022062	IAV	ICV9	K2	J1708	2002-07-05 1	2002-06-21 13:10:22.0	2002-06-21 1	30.0830	/ata1/012691.	479625	0
46211403062	IAV	ICV9	K2	J1708	2002-07-05 1	2002-06-21 17:14:03.0	2002-06-21 1	30.0830	/ata1/012691.	734278	0.01

Your Selected Filters

Dates are between 20-June-2002 and 05-August-2002
AND Instrumentation Type is 'J1708'
AND COURSE_NAME is 'Michaelsville Rd'
OR 'Route 22'
OR 'PTA Paved'

Show *All Channels* For Selected File(s)
Associate Comment With Selected File(s)...
Select All
Work With *One Channel* Across Selected Files...
Download Selected File(s)s...
Clear All
<-- Back
Next -->

VISION Digital Library



Working Across 130 Files

Select A Channel To Work With

- Total Engine PTO Hours
- Retarder Status
- Instantaneous Fuel Economy
- Vehicle Identification Number
- Injection Control Pressure
- Total Fuel Consumption
- Battery Voltage
- Trans Range Selected

Your Selected Filters

Dates are between 20-June-2002 and 05-August-2002
AND Instrumentation Type is 'J1708'
AND COURSE_NAME is 'Michaelsville Rd'
OR 'Route 22'
OR 'PTA Paved'

Histogram

Number OF Bins 32
Min Scale 0.0
Max Scale 20

RMS : 6.615 mpg
Mean : 6.015 mpg
StdDev : 2.754 mpg
Num Samples : 2,909
Num Bins : 32
Max : 18.769 mpg
Min : 0.644 mpg
10% : 2.330 mpg
90% : 8.765 mpg
Num Empty Bins : 2
% Empty Bins : 0.062

Instantaneous Fuel Economy (32 Bins)

Hold Shift Key Down While Dragging Mouse For Zoom
Right Click For Chart Customization Dialog

Thumbnails
Histogram
Threshold Crossing
Time In Limits
Generate
Adjust Bin Values
Reset Chart
Save As GIF
% Of Total
14
12
10
8
6
4
2
0
0
2
4
6
8
10
12
14
16
18
20
mpg

Business Opportunities

Acquisition Strategy

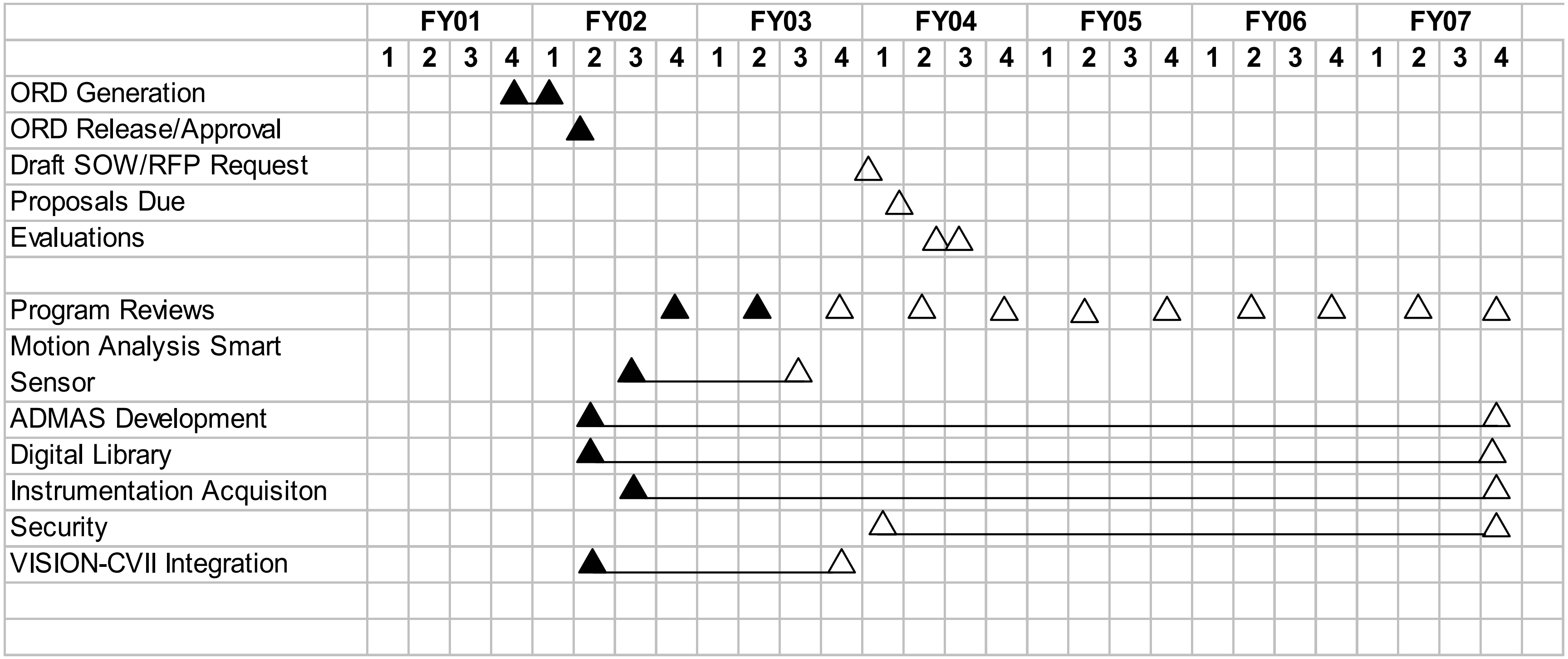
Individual awards for each VISION component development effort

FY04 Specific Areas of Interest

Digital Library

- Integration of Digital Library with Army Advanced Collaborative Environment (ACE)
- Integration of Digital Library with Army Test Incident Reporting System (ATIRS) Database
- Integration of Digital Library with Engineering Performance Database
- Development of Digital Video Library and image analysis tool sets
- Development/Integration of analysis tools

VISION
Program Schedule/Funding



	FY01				FY02				FY03				FY04				FY05				FY06				FY07			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ORD Generation				▲	▲																							
ORD Release/Approval						▲																						
Draft SOW/RFP Request													△															
Proposals Due													△															
Evaluations														△	△													
Program Reviews								▲		▲		△		△		△		△		△		△		△		△		△
Motion Analysis Smart Sensor							▲				△																	
ADMAS Development						▲																						△
Digital Library						▲																						△
Instrumentation Acquisiton							▲																					△
Security													△															△
VISION-CVII Integration						▲						△																

	Fiscal Year								
in millions $	**PRIOR**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Total Requirement	**0**	**0**	**$$**	**$$**	**$$$**	**$$$**	**$$$**	**$$$**	**$$**

SUMMARY

VISION integrates instrumentation and information technologies to yield a network centric/web centric approach to data acquisition, information management, and knowledge synthesis.

VISION will aid modeling and simulation efforts by providing high fidelity reusable data while decreasing the time required for test and evaluation.

Potential opportunities lay in the development of Smart Sensors and the Digital Library